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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/678,312

10/06/2003

Yoshitaka Sasaki

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12/02/2005

OLIFF & BERRIDGE, PLC

P.O. BOX 19928

ALEXANDRIA, VA 22320

EXAMINER

AHMED, SHAMIM

ART UNIT

PAPER NUMBER

1765

DATE MAILED: 12/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/678,312

Applicant(s)

SASAKI ET AL.

Examiner

Shamim Ahmed

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 5-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 5-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Terminal Disclaimer

1. The terminal disclaimer filed on 11/14/05 disclaiming the terminal portion of any patent granted on this application, which would extend beyond the expiration date of USP 6,854,175 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Response to Arguments

2. Applicant's arguments filed 11/14/05 have been fully considered but they are not persuasive. Applicants argue that none of the cited references teach the claimed process including the steps of reactive ion etching of the first magnetic material layer on the gap layer of aluminum oxide using a mask made of aluminum oxide as the context of claim 18.

In response to the argument, examiner states that the argument is not persuasive because it is true that Sasaki (USP 6,419,845) teaches the first magnetic material layer is ion-milled using a mask material layer of aluminum oxide (6) along with the photoresist mask (7) and a gap layer of aluminum oxide (4) is disposed in between the first and the second magnetic material layer (col.9, line 55-col.10, line 37 and figures 1-2).

However, Hara teaches reactive ion etching is preferable over ion milling magnetic material layer (see the rejection).

Therefore, it would have been obvious to one skilled in the art at the time of claimed invention to modify Sasaki's process with the teaching of Hara as Sasaki

Art Unit: 1765

acknowledges RIA generally performs with high processing precisions with high speed (see, col.11, lines 9-11).

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, examiner states that it must be recognized that any judgment on obviousness is in a sense necessary a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time of claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. *In re McLaughlin*, 443 F.2d 1392; 170 USPQ 209 (CCPA 1971).

Therefore, the previous office action is repeated herein as follows:

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

Art Unit: 1765

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 5-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki (JP 411339223A) in view of Hara et al (5,946,167) and further in view of Ichihara et al (5,607,599).

In the following rejection, Sasaki (USP 6,419,845) is used as an English language equivalent of the Japanese patent (JP 411339223A).

Sasaki discloses a method of making a thin-film magnetic head, wherein a first and second magnetic layers each including a magnetic pole and magnetically coupled to each other (see abstract).

Sasaki also teach that a gap layer is disposed in between the magnetic layers (see figure 1).

Sasaki teaches that a thin-film-coil portion is disposed in region of the second magnetic layer (see figure 21A).

Sasaki further teaches that both the magnetic layers are selectively etched by ion milling and the gap layer excluding a portion underlying the first uniform width portion is selectively etched by reactive ion etching (RIE) (col.10, lines 31-33 and col.11, lines 32-43).

Sasaki teaches that a first mask of inorganic material such as alumina (aluminum oxide) is used in the step of selective etching (col.9, lines 56-57 and col. 10, lines 6-11).

Sasaki fails to teach the magnetic layer is etched by reactive ion etching.

However, in a method of etching a magnetic layer, Hara et al teach that ion-milling or reactive ion etching (RIE) can be used but RIE is preferable in order to minimizing over-milling (col.7, lines 31-41).

Therefore, it would have been obvious to one skilled in the art at the time of claimed invention to combine Hara et al's teaching into Sasaki's method because both the ion-milling and RIE are functionally equivalent to etch magnetic layer, wherein over-milling can be minimized as taught by Hara et al.

Modified Sasaki discussed above but remain silent about the etching temperature is maintained in a range of 50 to 300 degree C.

However, in a method of reactive ion etching of a magnetic material, Ichihara et al teach that the processing temperature is maintained in a range of 100 to 300 degree C for etching the magnetic material with sufficiently high etch rate (col.7, lines 29-33).

Therefore, it would have been obvious to one skilled in the art at the time of claimed invention to combine Ichihara et al's teaching into modified Sasaki's process for efficiently etching the magnetic layer with sufficiently high etch rate as taught by Ichihara et al.

As to claims 5 - 7, Sasaki teaches that a first mask precursor layer made of the inorganic material is formed on a surface of the magnetic layer (6) by reactive ion etching and forming a second mask of photoresist (7) on a surface of the mask precursor layer (col.10, lines 21-26 and 30).

As to claims 8-10, Sasaki teaches that a pattern metal film can be formed on the surface of the mask precursor layer and used as a second mask (col.12, lines 9-22).

Art Unit: 1765

As to claims 12-15, Sasaki teaches the first magnetic material layer is formed by sputtering and the magnetic material comprises iron nitride (FeN), zirconium-cobalt-iron or amorphous alloy (col.9, lines 54-58 and lines 62-68).

As to claim 17, Sasaki teaches that the first magnetic layer, gap layer and the second magnetic layer are etched successively (col.13, lines 14-57, col.14, lines 9-18).

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shamim Ahmed whose telephone number is (571) 272-1457. The examiner can normally be reached on M-Thu (7:00-5:30) Every Friday Off.

Art Unit: 1765

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine G. Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Shamim Ahmed
Primary Examiner
Art Unit 1765

SA
November 28, 2005